

**ABSTRACT OF THE DISCLOSURE**

[0006] A Z-axis stage for use in, e.g., an orthogonal motion microscope stage, includes a carrier plate, an actuator plate, and a base. Three or more upper camming elements with downwardly directed camming surfaces are mounted to the underside of the carrier plate using a semi-kinematic mounting technique. Three or more lower camming elements with upwardly directed camming surfaces are mounted to the top surface of the base using a semi-kinematic mounting technique. The actuator plate includes apertures to accommodate the lower camming elements and the upper and lower camming surfaces of adjacent camming elements are mated. Linear slides are interposed between the mated camming surfaces and the lower camming elements and the base. Movement of the actuator plate in an X-Y reference plane translates into movement of the carrier plate along the Z-axis (i.e., the optical axis) in response to the relative, sliding motion of the mated camming elements.